

# ***DRAWMER***

# ***D-Clock***



## ***DMS-2***

### **WORD CLOCK MEASUREMENT AND DISTRIBUTION AMPLIFIER**

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## ONE YEAR LIMITED WARRANTY

Drawmer Electronics Ltd., warrants the Drawmer DMS-2 D-Clock work clock measurement and distribution amplifier to conform substantially to the specifications of this manual for a period of one year from the original date of purchase when used in accordance with the specifications detailed in this manual. In the case of a valid warranty claim, your sole and exclusive remedy and Drawmer's entire liability under any theory of liability will be to, at Drawmer's discretion, repair or replace the product without charge, or, if not possible, to refund the purchase price to you. This warranty is not transferable. It applies only to the original purchaser of the product.

For warranty service please call your local Drawmer dealer. Alternatively you can call Drawmer Electronics Ltd. directly at +44 (0)1709 527574. Then ship the defective product, with transportation and insurance charges pre-paid, to Drawmer Electronics Ltd., Coleman Street, Parkgate, Rotherham, S62 6EL UK. Write the RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem. Drawmer will not accept responsibility for loss or damage during transit.

This warranty is void if the product has been damaged by misuse, modification or unauthorised repair.

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**In the interests of product development, Drawmer reserve the right to modify or improve specifications of this product at any time, without prior notice.**

# DRAWMER

## *D-Clock*

### DMS-2

WORD CLOCK MEASUREMENT  
AND DISTRIBUTION AMPLIFIER

## SAFETY CONSIDERATIONS

### CAUTION - MAINS FUSE

TO REDUCE THE RISK OF FIRE  
REPLACE THE MAINS FUSE ONLY WITH  
A FUSE THAT **CONFORMS TO IEC127-2**.  
250 VOLT WORKING, TIME DELAY TYPE  
AND BODY SIZE OF 20mm x 5mm.  
THE MAINS INPUT FUSE MUST  
BE RATED AT T315mA.

### CAUTION - MAINS CABLE

DO NOT ATTEMPT TO CHANGE  
OR TAMPER WITH THE  
SUPPLIED MAINS CABLE.

### CAUTION - SERVICING

DO NOT PERFORM ANY SERVICING.  
REFER ALL SERVICING TO QUALIFIED  
SERVICE PERSONNEL.

### WARNING

TO REDUCE THE RISK OF FIRE OR  
ELECTRIC SHOCK DO NOT EXPOSE  
THIS EQUIPMENT TO RAIN OR MOISTURE.



For the USA

### FEDERAL COMMUNICATIONS COMMISSION RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, then the user is encouraged to try to correct the interference by one or more of the following measures:

Re-orient or relocate the receiving antenna.

Increase the separation between the equipment and the receiver.

Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for help.

Unauthorised changes or modification to this system can void the users' authority to operate this equipment. This equipment requires shielded interface cables in order to meet FCC class B limit.

For Canada

### CLASS B NOTICE

This digital apparatus does not exceed the Class B limits for radio noise emissions set out in the Radio Interference Regulations of the Canadian Department of Communications.

### CLASSE B AVIS

Cet appareil numérique ne dépasse pas les limites de la classe B au niveau des émissions de bruits radioélectriques fixés dans le Règlement des signaux parasites par le ministère Canadien des Communications.

# DRAWMER

## DMS-2

### ***D-Clock*** **WORD CLOCK MEASUREMENT AND DISTRIBUTION AMPLIFIER**

#### INTRODUCTION

Digital audio facilities often require a number of clock sources, which are used to synchronise outboard processors to the system clock rate using external clock inputs. The Drawmer D-Clock is a dual input, twenty output word clock distributor with a 16 character blue LCD display providing a high accuracy reference measurement of the incoming sample rate. It uses a high stability TCXO (temperature compensated xtal oscillator) along with a microcontroller to measure the incoming sample rate to an accuracy of 2ppm and displays the information in three different formats, actual frequency (to one decimal place), nominal frequency +/- ppm error, or nominal frequency plus percentage of pull up or pull down.

It has both AES/EBU and BNC word clock inputs featuring a zero latency loophrough output with switchable high impedance to maintain the correct level of the digital signal for onward distribution. Sixteen BNC clock outputs are situated on the rear panel with a further four BNC clock outputs on the front panel for quick patching to other digital devices.

The wordclock outputs can be fed from the wordclock input at any sample rate between 32KHz and 768KHz or derived from an AES11 input or stripped from an AES3 audio signal at any sample rate between 32KHz and 192KHz. Using an audio signal to provide the clock means even products without a wordclock output such as some analogue to digital converters, or one of the many mic pre's with internal A/D conversion but no word clock output, can be the master wordclock source for the whole digital studio.



- 2 in/20 out Clock Measurement and Distribution Amplifier
- Inputs: BNC with zero latency loophrough AES with with zero latency loophrough
- Outputs: BNC loophrough / AES loophrough 20 BNC clock outputs - 33 Ohms impedance
- 3 sample rate measurement LCD modes accurate to 2ppm
- Universal voltage filtered mains power input

## FEATURES OVERLAY



- ① **4x Front Panel Outputs:**  
4x **BNC** output connectors mounted on the front for ease of connectivity.
- ② **Display:**  
Blue/White liquid crystal display with three switchable modes of operation.
- ③ **Display Mode:**  
Switch to control the mode of display 2.
- ④ **Input Source Select:**  
Selects either the **AES** or **BNC** rear panel input source.
- ⑤ **Clock Present LED's:**  
Two led's showing the Locked status of the **AES** and **BNC** inputs.



- ⑥ **1x BNC Clock Input:**  
Input is selected using ④
- ⑦ **1x BNC Clock Through:**  
**BNC** output with zero latency loopthrough from BNC input.
- ⑧ **BNC Termination Sensitivity:**  
Switch to alter the **BNC** termination sensitivity between 75 Ohms and Hi Z. This must be switched to Hi Z when using Loop Through.
- ⑨ **AES Termination Sensitivity:**  
Switch to alter the **AES** termination sensitivity between 110 Ohms and Hi Z. This must be switched to Hi Z when using Loop Through.
- ⑩ **1x AES Input:**  
Input is selected using ④
- ⑪ **1x AES Through:**  
**AES** output with zero latency loopthrough from AES input.
- ⑫ **16x BNC Clock Outputs:**  
Buffered **BNC** wordclock outputs with 33 Ohms impedance.

## INSTALLATION

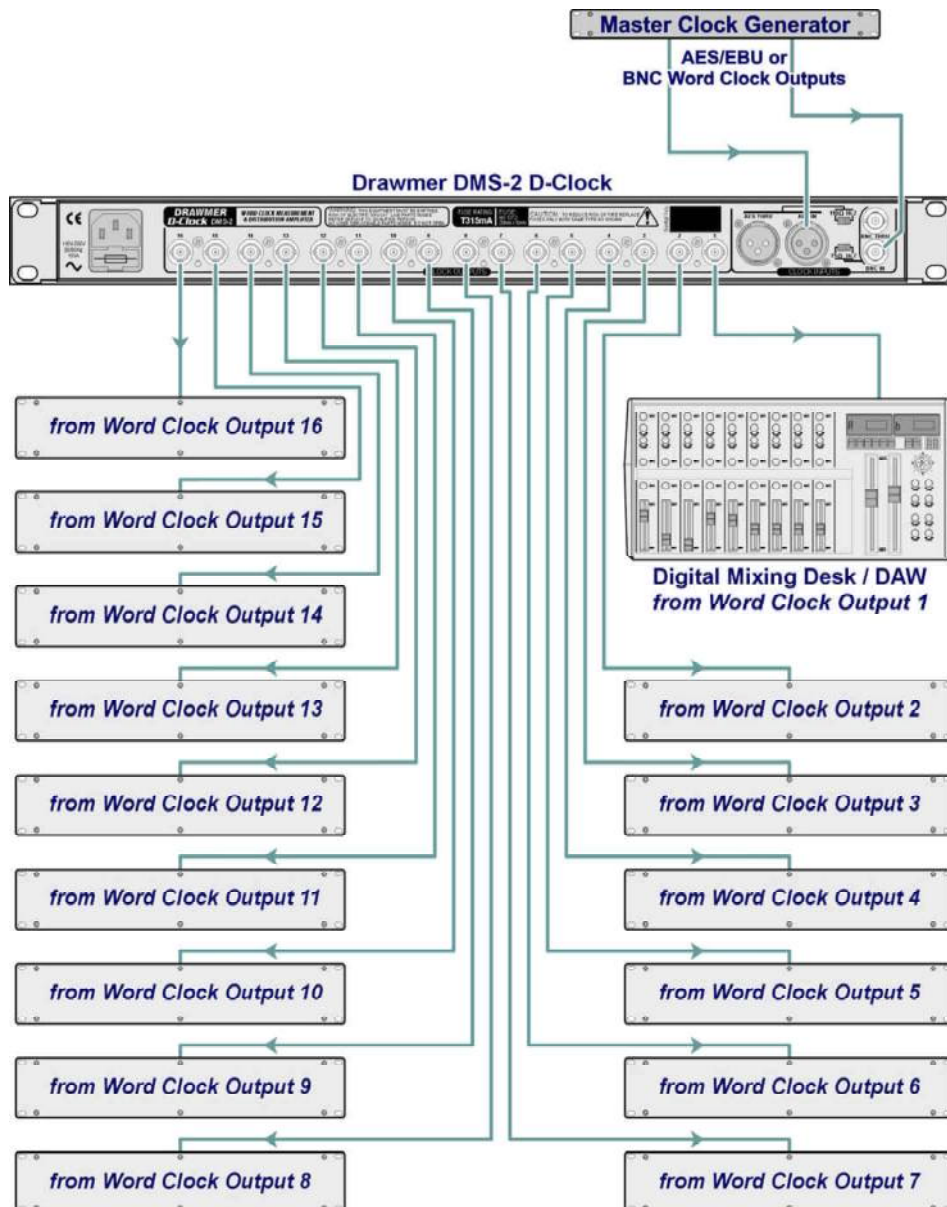
The DMS-2 D-Clock is designed for standard 19" rack mounting and occupies 1U of rack space. Avoid mounting the unit directly above power amplifiers or power supplies that radiate significant amounts of heat. If the unit is to be used in a mobile situation, it is strongly recommended that the rear of the unit is supported

in the carrying rack to avoid bending the front panel rack mounting 'ears'. Always connect the mains earth to the unit. Use fibre or plastic washers to prevent the front panel becoming marked by the mounting bolts.

## POWER CONNECTION

The unit will be supplied with a power cable suitable for domestic power outlets in your country. For your own safety it is important that you use this cable. The unit should always be connected to the mains supply earth using this cable.

Powered by a universal switch mode power supply, the DMS-2 D-Clock operates from mains voltages between 85 - 250v, eliminating the need to make any changes when touring and allowing the unit to remain fully operational during large fluctuations in the mains power supply.

**SIMPLE CONNECTION GUIDE**

**AUDIO CONNECTIONS**
**AES11**

Is via an XLR connector designed to be used with standard balanced microphone cable (20 metres maximum), wired pin 1 screen, pin 2 and 3 balanced data, and the XLR shell connected to the chassis. Having many short cables joined together is not advisable as each connector can cause undesirable signal reflections.

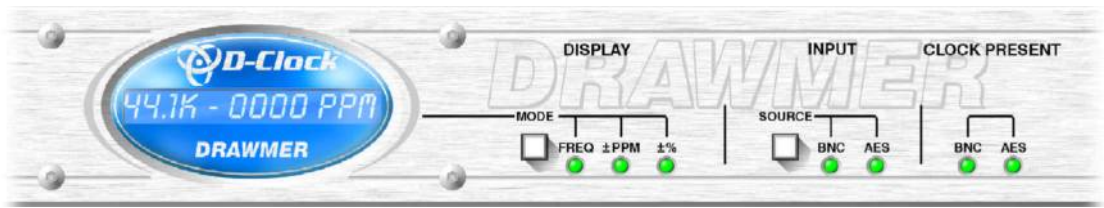
The output socket fully conforms to the EMC standards; if the unit is to be used where it may be exposed to high levels of disturbance, such as found close to a TV or radio transmitter, it is suggested that the screen of the data cable be connected to the chassis connection on the XLR type connector rather than to pin 1.

If ground loop problems are encountered, never disconnect the mains ground, but instead, try disconnecting the signal screen on one end of each cable connecting the outputs.

**Word Clock**

Use only good quality 75Ω digital or video coax (not aerial downlead) cable for the word-clock signals, terminated with the correct type of 75Ω BNC connectors - inferior cables will introduce jitter and will completely undermine the performance benefits which might be achieved by using a master clock in the first place!

# CONTROL DESCRIPTION



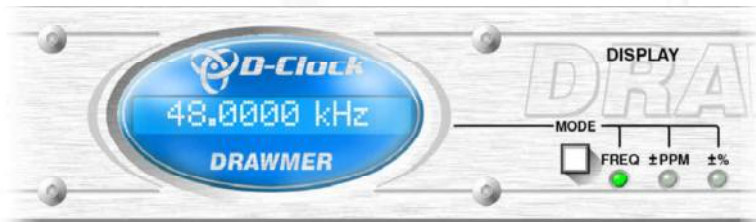
## DISPLAY

A Blue/White LCD display with three switchable modes of operation: **FREQ**, **±PPM** and **±%**. The mode that is displayed during power down is saved for the next session. The display accuracy is 2ppm at all sample rates up to 768kHz, or 0.1Hz increments @ 48KHz sample rate

## MODE

A switch controls the mode of display enabling you to read the incoming sample rate in your preferred manner. Pressing the switch toggles through the three modes of **FREQ**, **±PPM** and **±%**, with led indication.

## FREQ



Displays the actual frequency to four decimal places upto >768kHz.

## ±PPM



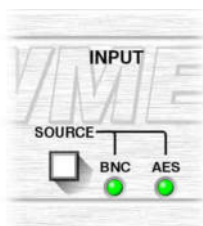
Displays the nominal sample rate with +/- ppm (part per million) error indication for 32, 44.1, 48, 96 & 192KHz

## ±%



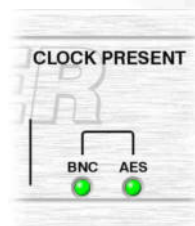
Displays the nominal sample rate with percentage pull up/down indication for 32, 44.1, 48, 96 & 192KHz

## INPUT SOURCE



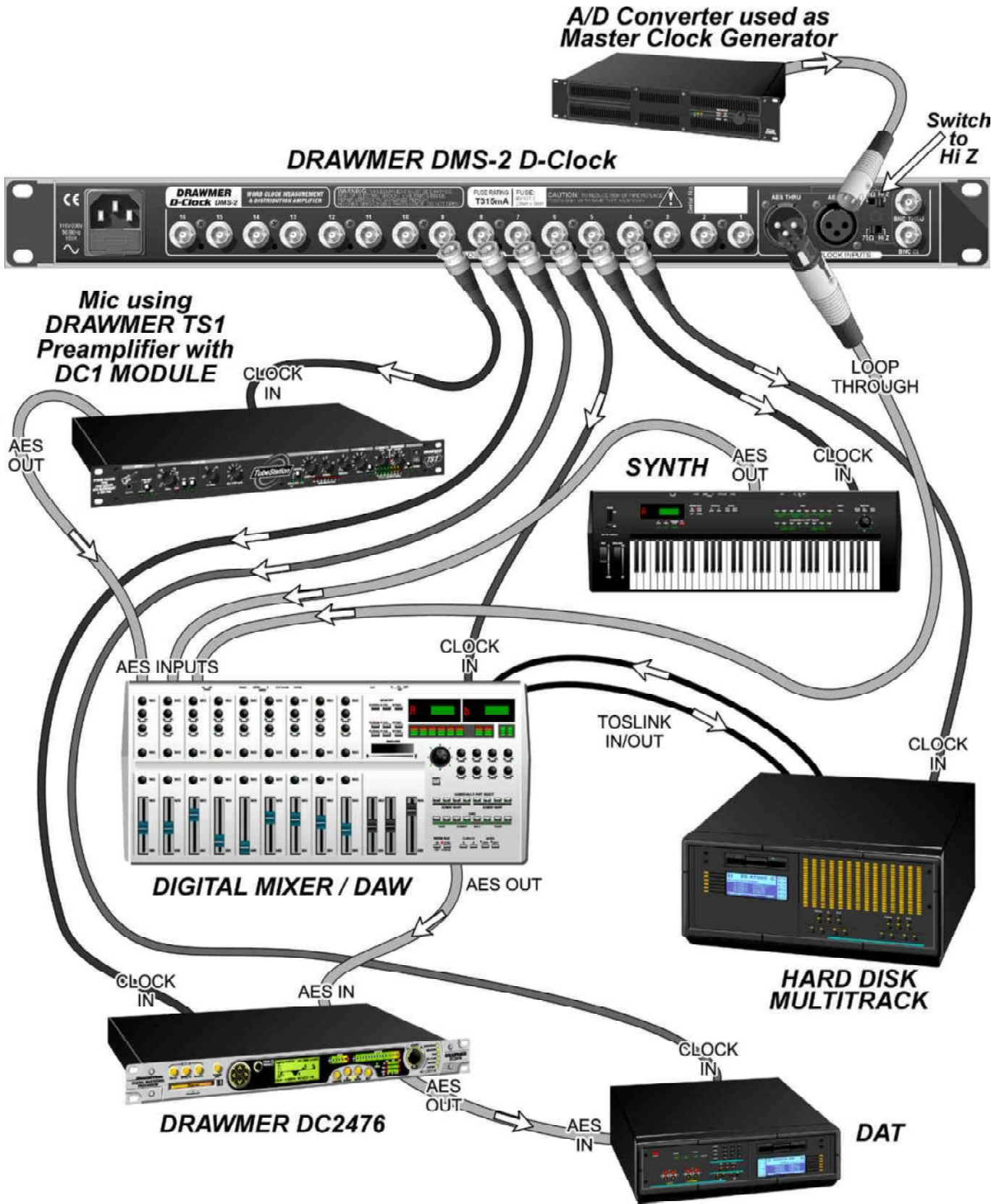
Sets the input source to be used - either AES or BNC as connected on the rear panel - with led indication.

## CLOCK PRESENT



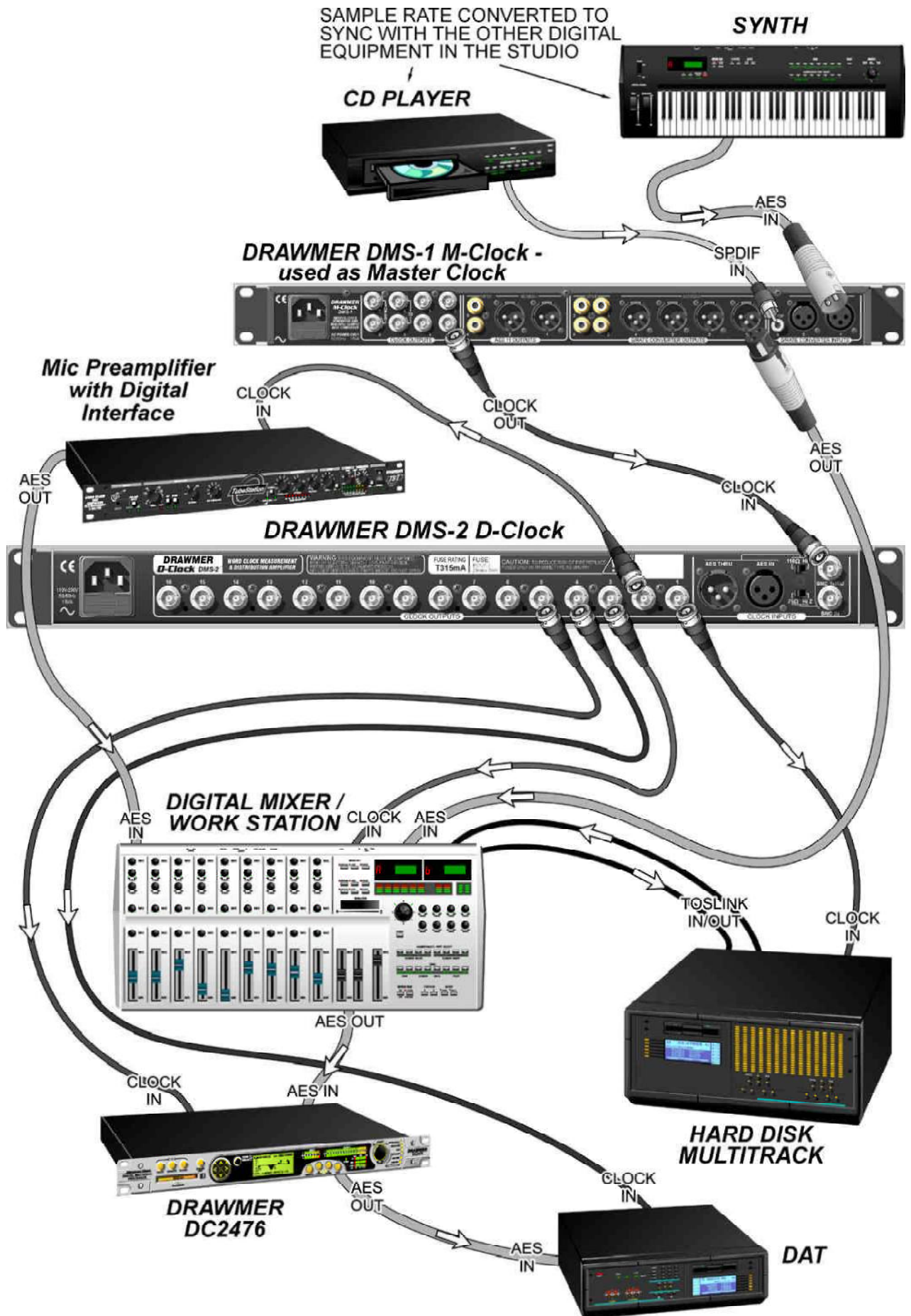
The two LED's indicate the status of the input sources. When a led is lit continuously a strong signal is being recieved by that input source and the D-Clock is "locked on". If a led flickers, the signal for that particular input source is weak or unstable - in this case the source of this weak signal should be located and improved.

**TYPICAL CONNECTION SETUP**





# CONNECTION SETUP FOR PRODUCTS WITH NO CLOCK OUTPUT



## D-Clock DMS-2 GENERAL INFORMATION

### IF A FAULT DEVELOPS

For warranty service please call Drawmer Electronics Ltd. or their nearest authorised service facility, giving full details of the difficulty.

A list of all main dealers can be found on the Drawmer webpages.

On receipt of this information, service or shipping instructions will be forwarded to you.

No equipment should be returned under the warranty without prior consent from Drawmer or their authorised representative.

For service claims under the warranty agreement a service Returns Authorisation (RA) number will be issued. Write this RA number in large letters in a prominent position on the shipping box. Enclose your name, address, telephone number, copy of the original sales invoice and a detailed description of the problem.

Authorised returns should be prepaid and must be insured.

All Drawmer products are packaged in specially designed containers for protection. If the unit is to be returned, the original container must be used. If this container is not available, then the equipment should be packaged in substantial shock-proof material, capable of withstanding the handling for the transit.

### CONTACTING DRAWMER

Drawmer Electronics Ltd., will be pleased to answer all application questions to enhance your usage of this equipment. Please address correspondence to:

Drawmer (Technical Help line)  
Coleman Street  
Parkgate  
Rotherham  
S62 6EL  
UK

Alternatively contact us by E-mail on :

[tech@drawmer.com](mailto:tech@drawmer.com)

Further information on all Drawmer dealers, Authorised service departments and other contact information can be obtained from our web pages on:

<http://www.drawmer.com>

### SPECIFICATION

#### INPUTS

BNC wordclock input      switchable 75ohm/hi z termination  
Sensitivity

AES sync input              switchable 110ohm/hiz termination  
Sensitivity                      120mV

#### LOOPTHROUGH OUTPUTS

BNC Output                    with zero latency loopthrough  
from input BNC

AES Output                    with zero latency loopthrough  
from AES input

#### MAIN OUTPUTS

BNC wordclock outputs      20 x simultaneous re-buffered BNC  
wordclock outputs with 33 ohm  
output impedance.  
4 of which are on the front panel  
for ease of connectivity.

#### DISPLAY

Blue/white LCD display with three switchable modes of operation with mode led indicators for each:

frequency                      actual frequency up to >768KHz

+/- ppm                        nominal sample rate with +/- ppm  
error indication for 32,44.1,48,96  
& 192KHz

+/-%                            Nominal sample rate with  
percent pull up/down indication  
for 32,44.1,48,96 & 192KHz

Accuracy                        2ppm at all sample rates up to  
768KHz  
0.1 Hz increments @ 48KHz  
sample rate

#### INDICATORS

AES/wordclock source select led indicators  
AES/wordclock clock present led indicators

#### GENERAL

Power Supply:                    Internal, Universal Input, 10 W

Power Requirement              <6W

Fuse Rating                      T315mA for All voltages.  
CONFORMING TO:  
IEC127-2

Fuse Type                        20mm x 5mm, Class 3 Slow -  
Blow. 250Volt working

Dimensions:                      1u, 19" Rack Mount, Depth  
145 mm

Weight                            1.7 kg

# BLOCK DIAGRAM

